AMENDMENTS TO THE CLAIMS

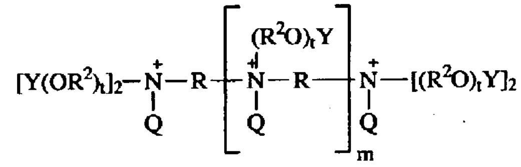
This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 to 23 – canceled

24. (new) A laundry detergent composition comprising:

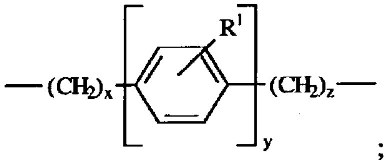
a) from about 0.01% to about 20% by weight, of a polyamine, said polyamine having the formula:



$$[Y(OR^2)_t]_2-\underset{Q}{\overset{+}{N}}-R-\left[\underset{Q}{\overset{(R^2O)_tY}{\overset{+}{N}}}-R-\right]_m\underset{Q}{\overset{+}{N}}-[(R^2O)_tY]_2$$

wherein R is a backbone unit selected from the group consisting of:

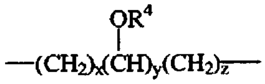
i) C_6-C_{16} substituted or unsubstituted arylene, C_7-C_{40} substituted or unsubstituted alkylenearylene having the formula:



;

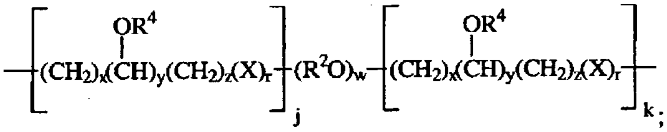
or mixtures thereof;

ii) hydroxyalkylene units having the formula:



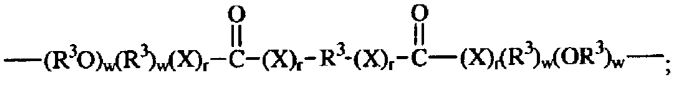
$$-(CH_2)_x(\overset{OR^4}{CH})_y(CH_2)_z-$$

iii) hydroxyalkylene/oxyalkylene units having the formula:



$$-\left[(CH_2)_x(\overset{OR^4}{CH})_y(CH_2)_z(X)_r\right]_j(R^2O)_w-\left[(CH_2)_x(\overset{OR^4}{CH})_y(CH_2)_z(X)_r\right]_k;$$

iv) a carboxyalkyleneoxy units having the formula:



$$-(R^3O)_w(R^3)_w(X)_r-\overset{O}{\overset{\|}{C}}-(X)_r-R^3-(X)_r-\overset{O}{\overset{\|}{C}}-(X)_r(R^3)_w(OR^3)_w-;$$

v) and mixtures thereof;

Y is selected from the group consisting of hydrogen, C_1-C_4 linear alkyl, -$N(R^1)_2$, an anionic unit selected from the group consisting of -$(CH_2)_fCO_2M$, -$C(O)(CH_2)_fCO_2M$, -$(CH_2)_fPO_3M$, -$(CH_2)_fOPO_3M$, -$(CH_2)_fSO_3M$, -$CH_2(CHSO_3M)(CH_2)_fSO_3M$, -$CH_2(CHSO_2M)(CH_2)_fSO_3M$, and mixtures thereof; wherein Y comprises at least one of the group selected from hydrogen, C_1-C_4 linear alkyl, and $N(R^1)_2$; wherein Z is hydrogen or an anionic unit selected from the group consisting of -$(CH_2)_fCO_2M$, -$C(O)(CH_2)_fCO_2M$, -$(CH_2)_fPO_3M$, -$(CH_2)_fOPO_3M$, -$(CH_2)_fSO_3M$, -$CH_2(CHSO_3M)$-$(CH_2)_fSO_3M$, -$CH_2(CHSO_2M)(CH_2)_fSO_3M$, -$C(O)CH_2CH(SO_3M)CO_2M$, -$C(O)CH_2CH(CO_2M)NHCH(CO_2M)CH_2CO_2M$, and mixtures thereof; M is hydrogen, a water soluble cation, and mixtures thereof; the index f is from 0 to about 6; the index m is from 0 to 20; R^1 is selected from the group consisting of:

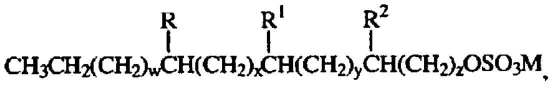
i) hydrogen;
ii) C_1-C_{22} alkyl;
iii) C_7-C_{22} aryleneaIkyl;
iv) C_7-C_{22} alkylenearyl;
v) -$[CH_2CH(OR^4)CH_2O]_s(R^2O)_tY$;
vi) anionic units;
vii) and mixtures thereof;

R^2 is selected from the group consisting of ethylene, 1,2-propylene, 1,3-propylene, 1,2-butylene, 1,4-butylene, 1,6 hexylene, 1,2-hexylene, 1,4-phenylene, and mixtures thereof; R^3 is C_2-C_8 linear alkylene, C_3-C_8 branched alkylene, phenylene, substituted phenylene, and mixtures thereof; R^4 is hydrogen, C_1-C_6 alkyl, -$(CH_2)_u(R^2O)_t(CH_2)_uY$, and mixtures thereof; wherein index s is from 0 to 5; the index t is from 0.5 to 100; the index u is from 0 to 6; index w is from 0 to 25; indices x and z are each independently from 0 to 20 and y is from 1 to 20; X is oxygen or the amino unit -NR^4-, the index r is 0 or 1; indices j and k are each independently from 1 to 20;

Q is a quaternizing unit selected from the group consisting of C_1-C_4 linear alkyl, C_1-C_4 hydroxyalkyl, benzyl, -$[CH_2CH(OR^4)CH_2O]_s(R^2O)_tY$, and mixtures thereof;

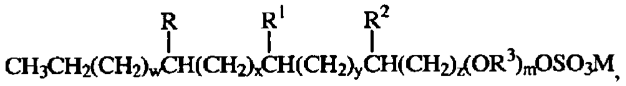
b) from about 0.01% to about 60% of a surfactant system comprising:

  i) from 0% to 80% by weight, of a mid-chain branched alkyl sulfate surfactant selected from the group consisting of surfactants having the formula:



$$\mathrm{CH_3CH_2(CH_2)_w\overset{R}{C}H(CH_2)_x\overset{R^1}{C}H(CH_2)_y\overset{R^2}{C}H(CH_2)_zOSO_3M},$$

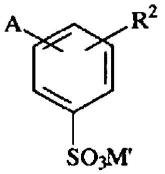
the formula:



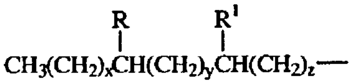
$$\mathrm{CH_3CH_2(CH_2)_w\overset{R}{C}H(CH_2)_x\overset{R^1}{C}H(CH_2)_y\overset{R^2}{C}H(CH_2)_z(OR^3)_mOSO_3M},$$

and mixtures thereof; wherein R, R^1, and R^2 of the mid-chain branched alkyl sulfate surfactant are each independently hydrogen, C_1-C_3 alkyl, and mixtures thereof, provided the total number of carbon atoms in said surfactant is from 14 to 20 and at least one of R, R^1, and R^2 of the mid-chain branched alkyl sulfate surfactant is not hydrogen; the index w of the mid-chain branched alkyl sulfate surfactant is an integer from 0 to 13; x of the mid-chain branched alkyl sulfate surfactant is an integer from 0 to 13; y of the mid-chain branched alkyl sulfate surfactant is an integer from 0 to 13; z of the mid-chain branched alkyl sulfate surfactant is an integer of at least 1; provided w + x + y + z of the mid-chain branched alkyl sulfate surfactant is from 8 to 14 and the total number of carbon atoms in a surfactant is from 14 to 20; R^3 of the mid-chain branched alkyl sulfate surfactant is ethylene, 1,2-propylene, 1,3-propylene, 1,2-butylene, 1,4-butylene, and mixtures thereof; the average value of the index m of the mid-chain branched alkyl sulfate surfactant is at least about 0.01;

ii) from 0% to 80% by weight, of a mid-chain branched aryl sulfonate surfactant having the formula:



wherein A of the mid-chain branched aryl sulfonate is a mid-chain branched alkyl unit having the formula:



$$\mathrm{CH_3(CH_2)_x\overset{R}{C}H(CH_2)_y\overset{R^1}{C}H(CH_2)_z}—$$

wherein R and R^1 of the mid-chain branched aryl sulfonate are each independently hydrogen, C_1-C_3 alkyl, and mixtures thereof, provided the total number of carbon atoms in said alkyl unit is from 6 to 18 and at least one of R and R^1 of the mid-chain branched aryl sulfonate is not hydrogen; x of the mid-chain branched aryl sulfonate is an integer from 0 to 13; y of the mid-chain branched aryl sulfonate is an integer from 0 to 13; z of the mid-chain branched aryl sulfonate is 0 or 1; R^2 of the mid-chain branched aryl sulfonate is hydrogen, C_1-C_3 alkyl, and mixtures thereof; M' of the mid-chain branched aryl sulfonate is a water soluble cation with sufficient charge to provide neutrality;

iii) optionally from 0.01% by weight, of a surfactant selected from the group consisting of anionic, nonionic, cationic, zwitterionic, ampholytic surfactants, and mixtures thereof; and

c) the balance carriers and adjunct ingredients.

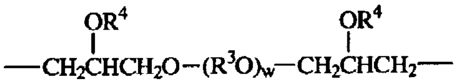
25. (new) A composition according to Claim 24 wherein R units of the polyamine are (a)(ii) hydroxyalkylene_units.

26. (new) A composition according to Claim 24 wherein R^2 of the polyamine is ethylene.

27. (new) A composition according to Claim 26 wherein the index m of the polyamine is from 1 to 3.

28. (new) A composition according to Claim 24 wherein said polyamine comprises hydroxyalkylene/oxyalkylene R backbone units wherein R^2 of the polyamine is selected from the group consisting of ethylene.

29. (new) A composition according to Claim 28 wherein said hydroxyalkylene/oxyalkylene R backbone units of the polyamine have the formula:



$$-CH_2\overset{\overset{\displaystyle OR^4}{|}}{C}HCH_2O-(R^3O)_w-CH_2\overset{\overset{\displaystyle OR^4}{|}}{C}HCH_2-$$

wherein each R^3 of the polyamine is independently ethylene, propylene, and mixtures thereof; R^4 of the polyamine is hydrogen, $-(R^2O)_tY$, and mixtures thereof; w of the polyamine is from 1 to about 5.

30. (new) A composition according to Claim 29 wherein R^4 of the polyamine is hydrogen.

31. (new) A composition according to Claim 24 wherein said Y units are oligomeric, polymeric, and mixtures thereof.

32. (new) A composition according to Claim 24 wherein the laundry detergent is a granular laundry detergent.

33. (new) A composition according to Claim 32 wherein said Y units comprises at least one of the group selected from hydrogen, C_1-C_4 linear alkyl, and $N(R^1)_2$ and such that greater than about 40% of said Y units are $-SO_3M$ units, M is hydrogen, a water soluble cation, and mixtures thereof.

34. (new) A composition according to Claim 24 wherein the laundry detergent is a liquid laundry detergent.

35. (new) A composition according to Claim 34 wherein said Y units comprises at least one of the group selected from hydrogen, C_1-C_4 linear alkyl, and $N(R^1)_2$ and such that less than about 90% of said Y units are $-SO_3M$ units, M is hydrogen, a water soluble cation, and mixtures thereof.

36. (new) A composition according to Claim 24 comprising from about 0.01% by weight of a mid-chain branched aryl sulphonate surfactant admixture wherein at least one of said surfactants which comprises said admixture comprises R of the mid-chain branched aryl sulphonate surfactant is equal to methyl, R^1 of the mid-chain branched aryl sulphonate surfactant is equal to methyl, R^2 of the mid-chain branched aryl sulphonate surfactant is equal to hydrogen, and z of the mid-chain branched aryl sulphonate surfactant is equal to 0.

37. (new) A composition according to Claim 36 wherein at least 75% of said surfactants which comprise said admixture have R^1 of the mid-chain branched aryl sulphonate

surfactant is equal to methyl and z of the mid-chain branched aryl sulphonate surfactant is equal to 0.

38. (new) A composition according to Claim 24 comprising from about 0.01% by weight of a mid-chain branched alkyl sulfate surfactant admixture wherein at least one of said surfactants which comprises said admixture comprises R of the mid-chain branched alkyl sulfate surfactant is equal to methyl, R^1 of the mid-chain branched alkyl sulfate surfactant is equal to hydrogen, R^2 of the mid-chain branched alkyl sulfate surfactant is equal to hydrogen, and the sum of $w + x + y + z$ of the mid-chain branched alkyl sulfate surfactant is equal to from 8 to 10.

39. (new) A composition according to Claim 38 wherein at least 75% of said surfactants which comprise said admixture have R of the mid-chain branched alkyl sulfate surfactant is equal to methyl and w of the mid-chain branched alkyl sulfate surfactant is_equal to 0.

40. (new) A composition according to Claim 24 comprising from about 0.01% by weight of a mid-chain branched alkyl alkoxy sulfate surfactant admixture wherein at least one of said surfactants which comprises said admixture comprises R of the mid-chain branched alkyl alkoxy sulfate surfactant is equal to methyl, R^1 of the mid-chain branched alkyl alkoxy sulfate surfactant is equal to hydrogen, R^2 of the mid-chain branched alkyl alkoxy sulfate surfactant is equal to hydrogen, the sum of $w + x + y + z$ of the mid-chain branched alkyl alkoxy sulfate surfactant is equal to from 8 to 10, and m of the mid-chain branched alkyl alkoxy sulfate surfactant is from 1 to 7.

41. (new) A composition according to Claim 40 wherein at least 75% of said surfactants which comprise said admixture have R of the mid-chain branched alkyl alkoxy sulfate surfactant is equal to methyl and w of the mid-chain branched alkyl alkoxy sulfate surfactant is equal to 0.

42. (new) A composition according to Claim 41 wherein m of the mid-chain branched alkyl alkoxy sulfate surfactant is from 2 to 5.

43. (new) A composition according to Claim 24 comprising from about 0.01% by weight of a surfactant admixture said admixture comprising one or more mid-chain branched alkyl sulfate surfactants and one or more mid-chain branched alkyl alkoxy sulfate surfactants

wherein at least one of said surfactants which comprises said admixture comprises R of the mid-chain branched alkyl sulfate or alkyl alkoxy sulfate surfactant is equal to methyl, R^1 of the mid-chain branched alkyl sulfate or alkyl alkoxy sulfate surfactant is equal to hydrogen, R^2 of the mid-chain branched alkyl sulfate or alkyl alkoxy sulfate surfactant is equal to hydrogen, and the sum of $w + x + y + z$ of the mid-chain branched alkyl sulfate or alkyl alkoxy sulfate surfactant is equal to from 8 to 10 and the average value of m of the mid-chain branched alkyl sulfate or alkyl alkoxy sulfate surfactant is from about 0.01 to 10.

44. (new) A composition according to Claim 43 wherein at least 75% of said surfactants which comprise said admixture have R of the mid-chain branched alkyl sulfate or alkyl alkoxy sulfate surfactant is equal to methyl and w of the mid-chain branched alkyl sulfate or alkyl alkoxy sulfate surfactant is equal to 0.

45. (new) A composition according to Claim 24 further comprising about 1% by weight of a builder.

46. (new) A composition according to Claim 24 further comprising from about 1% by weight, of a peroxygen bleaching system comprising:

i) from about 40% by weight, of the bleaching system, a source of hydrogen peroxide;

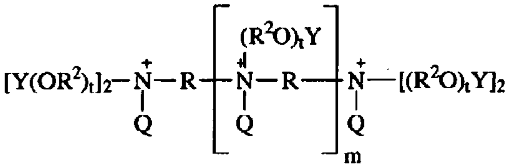
ii) optionally from about 0.1% by weight, of the bleaching system, a bleach activator;

iii) optionally from about 1 ppb of the composition, of a transition-metal bleach catalyst; and

iv) optionally from about 0.1% by weight, of a pre-formed peroxygen bleaching agent.

47. (new) A laundry detergent composition comprising:

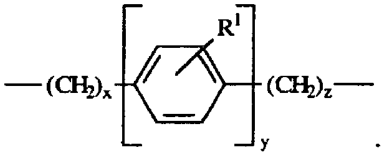
a) from about 0.01% to about 20% by weight, of a polyamine, said polyamine having the formula:



$$[Y(OR^2)_t]_2-\underset{Q}{\overset{+}{N}}-R-\left[\underset{Q}{\overset{(R^2O)_tY}{\overset{+}{N}}}-R\right]_m-\underset{Q}{\overset{+}{N}}-[(R^2O)_tY]_2$$

R is a backbone unit selected from the group consisting of:

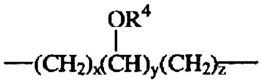
i) C_6-C_{16} substituted or unsubstituted arylene, C_7-C_{40} substituted or unsubstituted alkylenearylene having the formula:



;

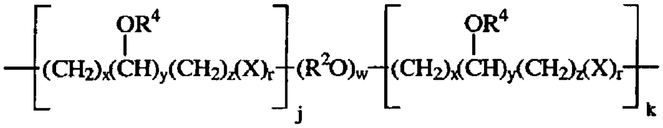
or mixtures thereof;

ii) hydroxyalkylene units having the formula:



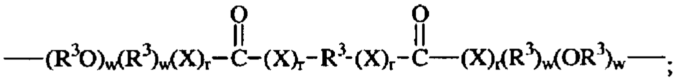
$$-(CH_2)_x(\overset{OR^4}{CH})_y(CH_2)_z-$$

iv) hydroxyalkylene/oxyalkylene units having the formula:



$$-\left[(CH_2)_x(\overset{OR^4}{CH})_y(CH_2)_z(X)_r\right]_j(R^2O)_w-\left[(CH_2)_x(\overset{OR^4}{CH})_y(CH_2)_z(X)_r\right]_k-$$

v) carboxyalkyleneoxy units having the formula:



$$-(R^3O)_w(R^3)_w(X)_r-\overset{O}{\overset{\|}{C}}-(X)_r-R^3-(X)_r-\overset{O}{\overset{\|}{C}}-(X)_r(R^3)_w(OR^3)_w-;$$

and mixtures thereof;

R^1 is selected from the group consisting of:

i) hydrogen;

ii) C_1-C_{22} alkyl;

iii) C_7-C_{22} arylenealkyl;

iv) C_7-C_{22} alkylenearyl;

v) $-[CH_2CH(OR^4)CH_2O]_s(R^2O)_tY$;

vi) anionic units;

vii) and mixtures thereof;

R^2 is selected from the group consisting of ethylene, 1,2-propylene, 1,3-propylene, 1,2-butylene, 1,4-butylene, 1,6 hexylene, 1,2-hexylene, 1,4-phenylene, and mixtures thereof;

R^3 is C_2-C_8 linear alkylene, C_3-C_8 branched alkylene, phenylene, substituted phenylene, and mixtures thereof;

R^4 is hydrogen, C_1-C_6 alkyl, $-(CH_2)_u(R^2O)_t(CH_2)_uY$, and mixtures thereof;

Q is a quaternizing unit selected from the group consisting of C_1-C_4 linear alkyl, C_1-C_4 hydroxyalkyl, benzyl, $-[CH_2CH(OR^4)CH_2O]_s(R^2O)_tY$, and mixtures thereof;

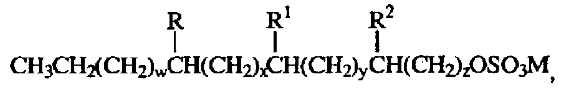
X is oxygen, $-NR^4-$, and mixtures thereof;

Y is selected from the group consisting of hydrogen, C_1-C_4 linear alkyl, $-N(R^1)_2$, an anionic unit selected from the group consisting of $-(CH_2)_fCO_2M$, $-C(O)(CH_2)_fCO_2M$, $-(CH_2)_fPO_3M$, $-(CH_2)_fOPO_3M$, $-(CH_2)_fSO_3M$, $-CH_2(CHSO_3M)(CH_2)_fSO_3M$, $-CH_2(CHSO_2M)(CH_2)_fSO_3M$, and mixtures thereof; wherein Y comprises at least one of the group selected from hydrogen, C_1-C_4 linear alkyl, and $N(R^1)_2$; wherein Z is hydrogen or an anionic unit selected from the group consisting of $-(CH_2)_fCO_2M$, $-C(O)(CH_2)_fCO_2M$, $-(CH_2)_fPO_3M$, $-(CH_2)_fOPO_3M$, $-(CH_2)_fSO_3M$, $-CH_2(CHSO_3M)-(CH_2)_fSO_3M$, $-CH_2(CHSO_2M)(CH_2)_fSO_3M$, $-C(O)CH_2CH(SO_3M)CO_2M$, $-C(O)CH_2CH(CO_2M)NHCH(CO_2M)CH_2CO_2M$, and mixtures thereof; M is hydrogen, a water soluble cation, and mixtures thereof; the index f is from 0 to about 6; the index m is from 0 to 20;

the index j is from 1 to 20; the index k is from 1 to 20; the index r is 0 or 1; the index s is from 0 to 5; the index t has an average value of from about 0.5 to about 100; the index u is from 0 to 6; the index w is from 0 to 25; the indices x and z are each independently from 0 to 20 and y is from 1 to 20;

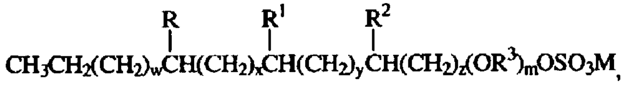
b) from about 0.01% to about 60% by weight, of a surfactant system comprising:

  i) from 0% to 80% by weight, of a mid-chain branched alkyl sulfate surfactant selected from the group consisting of surfactants having the formula:



$$CH_3CH_2(CH_2)_w\overset{R}{\overset{|}{C}}H(CH_2)_x\overset{R^1}{\overset{|}{C}}H(CH_2)_y\overset{R^2}{\overset{|}{C}}H(CH_2)_zOSO_3M,$$

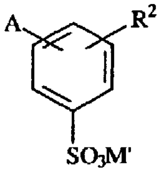
the formula:



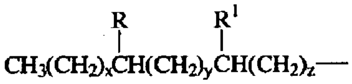
$$\mathrm{CH_3CH_2(CH_2)_w\overset{R}{\overset{|}{C}}H(CH_2)_x\overset{R^1}{\overset{|}{C}}H(CH_2)_y\overset{R^2}{\overset{|}{C}}H(CH_2)_z(OR^3)_mOSO_3M},$$

and mixtures thereof; wherein R, R^1, and R^2 of the mid-chain branched alkyl sulfate surfactant are each independently hydrogen, C_1-C_3 alkyl, and mixtures thereof, provided the total number of carbon atoms in said surfactant is from 14 to 20 and at least one of R, R^1, and R^2 of the mid-chain branched alkyl sulfate surfactant is not hydrogen; the index w of the mid-chain branched alkyl sulfate surfactant is an integer from 0 to 13; x of the mid-chain branched alkyl sulfate surfactant is an integer from 0 to 13; y of the mid-chain branched alkyl sulfate surfactant is an integer from 0 to 13; z of the mid-chain branched alkyl sulfate surfactant is an integer of at least 1; provided w + x + y + z of the mid-chain branched alkyl sulfate surfactant is from 8 to 14 and the total number of carbon atoms in a surfactant is from 14 to 20; R^3 of the mid-chain branched alkyl sulfate surfactant is ethylene, 1,2-propylene, 1,3-propylene, 1,2-butylene, 1,4-butylene, and mixtures thereof; the average value of the index m of the mid-chain branched alkyl sulfate surfactant is at least about 0.01;

ii) from 0% to 80% by weight, of a mid-chain branched aryl sulfonate surfactant having the formula:



wherein A of the mid-chain branched aryl sulfonate surfactant is a mid-chain branched alkyl unit having the formula:



$$\mathrm{CH_3(CH_2)_x\overset{R}{\overset{|}{C}}H(CH_2)_y\overset{R^1}{\overset{|}{C}}H(CH_2)_z}—$$

wherein R and R^1 of the mid-chain branched aryl sulfonate surfactant are each independently hydrogen, C_1-C_3 alkyl, and mixtures thereof, provided the total number of carbon atoms in said alkyl unit is from 6 to 18 and at least one of R and R^1 of the mid-chain branched aryl sulfonate surfactant is not hydrogen; x of the mid-chain branched aryl sulfonate surfactant is an integer from 0 to 13; y of the mid-chain branched aryl sulfonate surfactant is an integer from 0 to 13; z of the mid-chain branched aryl sulfonate surfactant is 0 or 1; R^2 of the mid-chain branched aryl sulfonate surfactant is hydrogen, C_1-C_3 alkyl, and mixtures thereof; M' of the mid-chain branched aryl sulfonate surfactant is a water soluble cation with sufficient charge to provide neutrality;

iii) optionally from 0.01% by weight, of a surfactant selected from the group consisting of anionic, nonionic, cationic, zwitterionic, ampholytic surfactants, and mixtures thereof;

c) from about 1 ppb of the composition, of a transition-metal bleach catalyst;

d) from about 1% by weight, of a builder; and

e) the balance carriers and adjunct ingredients.